



Cryptic *Rhinolophus pusillus* Temminck, 1834 (Chiroptera, Rhinolophidae): a new distribution record from the Chittagong Hill Tracts, Bangladesh

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Abstract

Rhinolophus pusillus is a common species of India and Nepal in South Asia. Here, we report a new record of this bat captured in the mixed evergreen forest in Rangamati, southeastern part of Bangladesh. The identification was based on external morphology along with cranio-dental measurements. Roost counts was conducted through direct observation.

Key words

Cave; bats, mixed colony; new record.

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Introduction

The Least Horseshoe Bat, *Rhinolophus pusillus* Temminck, 1834 is native to Southeast Asia and can be found in Myanmar, Thailand, Laos, Vietnam, Cambodia, Peninsular Malaysia, Borneo and also including India, South China to Indonesia (Francis 2008, Hutson et al. 2008). Like other horseshoe bats, it naturally resides in caves, clumps of bamboo, or more seldom in houses (Hutson et al. 2008), but recent study suggests that this species is more suited to evergreen forests (Soisook et al. 2016). Although *R. pusillus* is widely distributed on the eastern part of Asia, little information is available from the southern part of its range, with just a few records from India and Nepal (Bates and Harrison 1997, Molur et al. 2002).

The Chittagong Hill Tracts (CHT) is positioned at the southeastern part of Bangladesh and border the Indo-Burma biodiversity hotspot (Myers et al. 2000). The CHT is a mixed-evergreen forest, the last remaining habitat

for several endangered species in Bangladesh (IUCN Bangladesh 2015, Khan 2015). Among these species, bats are an important part of the fauna because of the availability of caves, gorges and crevices in the hills, but unfortunately they are least studied. During a survey of bats in the CHT, a colony was detected in a small cave at Rajasthali upazila, Rangamati district (22°20.914' N, 92°16.676' E) on 6 August 2016 (Fig. 1). The cave is roughly 12.2 m long, 3.1 m high and 0.6 m wide, but the entrance was narrower. It hosted a mixed colony of up to 20 individuals of horseshoe bats and leaf-nosed bats.

Methods

Two individuals were captured with a mist net while the remainder of the bats hid inside the chamber. Standard protocol was maintained in the bat's capture (Kunz and Kurta 1988) and measurements were taken with digital

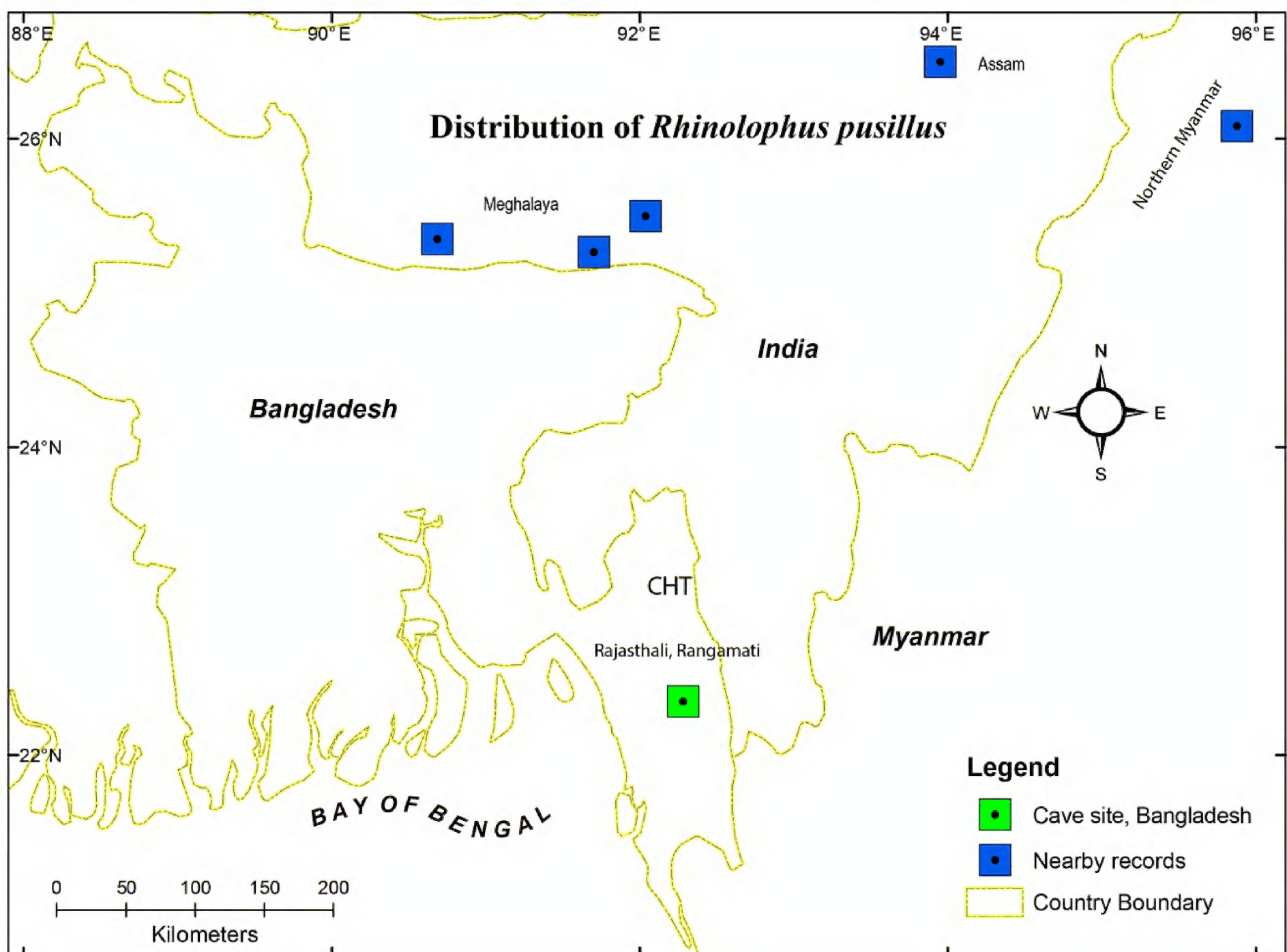


Figure 1. The new record of *Rhinolophus pusillus* from Bangladesh; the green square is the cave site from Bangladesh whereas the blue squares are the nearest records of *R. pusillus* reported from Meghalaya, Assam and northern Myanmar.

slide caliper with accuracy to the nearest 0.01 mm. Among the 2 captured bats, 1 was identified as *Hipposideros larvatus* (Horsfield, 1823) and the one was an unidentified adult horseshoe bat. Unable to be identified in the field, it was deposited as a voucher specimen (WLMA-0011) in the Wildlife Lab, Department of Zoology at Jahangirnagar University, Bangladesh.

The measurements were taken into head and body (HB), forearm (FA), tibia length (TIB), greatest length of skull (GTL), condylo-canine length (CCL), zygomatic breadth (ZB), braincase breadth (BB), maxillary tooth

row ($C-M^3$), mandibular tooth row ($C-M_3$), anterior palatal width (C^1-C^1) and posterior palatal width (M^3-M^3).

Results

We identify this specimen as the Least Horseshoe Bat, *Rhinolophus pusillus* Temminck, 1834 based on the forearm length, greatest length of skull, condylo-canine length and maxillary tooth row (Table 1). The nose-leaf structure also supports the identification. The broadly pointed lancet, with slightly concave on sides, as well

Table 1. Relative measurement of similar Horseshoe Bats studied by Bates and Harrison (1997). Ranges are in parenthesis. Abbreviations: see Methods.

Attributes	Specimen (WLMA-0011)	<i>R. pusillus</i>	<i>R. lepidus</i>	<i>R. subbadius</i>
HB	39.18	35.9 (30–40)	42.9 (35–54)	36.3 (35–37)
FA	37.44	37 (34.9–37.8)	39.8 (37–41.8)	34.3 (33.4–35.9)
TIB	14.03	15.2 (14.2–16.3)	16.7 (14.9–18.4)	14.5 (13.9–15)
GTL	16.24	16.2 (15.6–17.2)	17.2 (16.2–18.4)	14.6 (14.5–14.6)
CCL	13.70	13.6 (13–14)	14.6 (13.8–15.5)	12.4 (11.9–12.9)
ZB	7.68	7.5 (7.1–7.8)	8.2 (7.6–8.8)	—
BB	6.72	6.7 (6.4–7)	7.1 (6.5–7.8)	6.2 (6–6.5)
$C-M^3$	5.90	5.8 (5.4–6)	6.1 (5.6–6.8)	5.3 (5.1–5.5)
$C-M_3$	6.38	6.1 (5.9–6.3)	6.6 (6–7.4)	5.6 (5.2–5.8)
C^1-C^1	3.87	3.7 (3.4–3.9)	4 (3.7–4.2)	2.9 (2.7–3.2)
M^3-M^3	5.81	5.6 (5.4–5.8)	5.9 (5.7–6.3)	4.7 (4.4–4.9)



Figure 2. An adult male (WLMA-0011) of *Rhinolophus pusillus* from Bangladesh, nose-leaf structure. **A.** Front view. **B.** Lateral view.



Figure 3. Skull of an adult male (WLMA-0011) of *Rhinolophus pusillus* from Bangladesh.

as the parallel-sided sella, pointed connecting process and distinct constriction in the middle are key features used for identification of this species (Csorba et al. 2003, Francis 2008) (Fig. 2).

In measurements, most the attributes of our specimen is nearer with *R. pusillus*; FA, 37.44 mm vs 37 mm; GTL, 16.24 mm vs 16.2 mm; CCL, 13.7 mm vs 13.6 mm; C–M³, 5.9 mm vs 5.8 mm (Table 1). A similar horseshoe bat, *R. lepidus* Blyth, 1844, is comparatively larger than our specimen and can be differentiated by: GTL, 17.20 mm vs 16.24 mm; CCL, 14.6 mm vs 13.7 mm; and C–M³: 6.1 mm vs 5.90 mm (Table 1). The rostral profile is curving upward in *R. lepidus* whereas straighter in our specimen (Fig. 3). Another species, *R. subbadius* Blyth, 1844, is

smaller than our specimen: GTL, 14.6 mm vs 16.24 mm; CCL, 12.4 mm vs 13.7 mm; M³–M³: 4.7 mm vs 5.81 mm (Table 1).

Discussion

Bat diversity and abundance studies are rare in Bangladesh with only a few checklists published (Khan 2001, 2015, Sarker and Sarker 2005, Srinivasulu and Srinivasulu 2005). Recently, previous works were compiled by IUCN Bangladesh (2015); the resulting list includes 35 bat species from throughout the Bangladesh, but *R. pusillus* was not among the known species. The new locality of *R. pusillus* reported here from the southeastern Bangladesh

is the first for the country and extends the range of this species by approximately 550 km south from the nearest previously known occurrence in India (Fig. 1).

Apparently, no obvious threats are known because the ethnic people residing nearby do not hunt bats for meat or medicine. The entrance of the cave is narrow, which minimizes the chance for disturbance. Further investigation is recommended on ecological aspects of *R. pusillus* from the study area.

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